AMENDMENTS TO THE CLAMS

1. (Currently amended) A method for adaptive filtering a signal received over a channel subjected to multipath effects, the method comprising:

determining filter coefficients $\hat{\underline{c}}$, such that $\hat{\underline{c}} = E\left[\hat{\underline{\underline{r}}}\hat{\underline{\underline{r}}}^{H}\right]^{-1}\hat{\underline{s}}_{\text{desired}}$, where

E is the expected value operator,

$\hat{\underline{r}}$ is the received signal,

$\hat{\underline{s}}_{\text{desired}}$ is the modified steering vector of the desired signal, and

$\hat{\underline{s}}_{\text{desired}} = \underline{s}_{\text{desired}} * \underline{h}$, where

$\underline{h} = [h_1, h_2, \ldots, h_L]$is a discrete time estimate of the effect of multipath on the channel and L is the delay spread of the channel for the estimate.

2. (Original) The method of claim 1, wherein the steering vector of the desired signal is the spreading sequence of the desired signal in a code division multiple access communication system.

3. (Original) A method for adaptively analyzing an observed signal, the signal characterized by a set of data vectors, to estimate that part of the signal that best corresponds to a steering vector, the method comprising:

modifying the steering vector, wherein the modified steering vector is formed by the convolution of the steering vector with a vector estimating the effect of multipath on the observed signal;

in a first analysis stage:

projecting each data vector onto the steering vector to form a set of inner products that estimate the part .of the data that best corresponds to the steering vector,

multiplying the inner products onto the steering vector to form a set of vector estimates of that part of the data that best corresponds to the steering vector,

subtracting the vector estimates from the corresponding data vectors to obtain a projection of the data onto the nullspace of the steering vector; and

in at least one adaptive analysis stage:

calculating a correlation direction vector of the current adaptive stage between the corresponding inner products and vector differences of an immediately prior analysis stage;

forming inner products of the current stage by projecting each vector difference of the immediately prior analysis stage onto the correlation direction vector of the current stage;

forming scaled vectors of the current stage by multiplying the inner products of the current stage onto the correlation direction vector of the current stage;

forming the projection of the prior stage vector differences onto the nullspace of the correlation direction vector of the current stage by subtracting each scaled vector of the current stage from the corresponding projection of the prior stage.

4. (Previously Presented) The method of Claim 1 wherein the steering vector comprises the spreading code of a code division multiple access (CDMA)

5. (Currently amended) A computer program product for adaptive filtering a signal received over a channel subjected to multipath effects, the computer program product comprising:

a computer-readable medium;

at least one program module stored on the medium, the at least one program module operative to:

determining filter coefficients $\hat{c}$, such that $\hat{c} = E\left[\hat{r}\hat{r}^H\right]^{-1}\hat{s}_{\text{desired}}$, where

E is the expected value operator,

$\hat{r}$ is the received signal,

$\hat{s}_{\text{desired}}$ is the modified steering vector of the desired signal, and

$\hat{s}_{\text{desired}} = \bar{s}_{\text{desired}} * \bar{h}$, where

$\bar{h} = [h_1, h_{2,\ldots} h_L]$is a discrete time estimate of the effect of multipath on the channel and L is the delay spread of the channel for the estimate.

6. (Original) The computer program product of claim 5, wherein the steering vector of the desired signal is the spreading sequence of the desired signal in a code division multiple access communication system.

7. (Original) A computer program product for adaptively analyzing an observed signal, the signal characterized by a set of data vectors, to estimate that part of the signal that best corresponds to a steering vector, the computer program product comprising:

a computer-readable medium;

at least one program module stored on the medium, the at least one program module operative to:

modify the steering vector, wherein the modified steering vector is formed by the convolution of the steering vector with a vector estimating the effect of multipath on the observed signal;

in a first analysis stage:

project each data vector onto the steering vector to form a set of inner products that estimate the part of the data that best corresponds to the steering vector,

multiply the inner products onto the steering vector to form a set of vector estimates of that part of the data that best corresponds to the steering vector,

subtract the vector estimates from the corresponding data vectors to obtain a projection of the data onto the nullspace of the steering vector; and

in at least one adaptive analysis stage:

calculate a correlation direction vector of the current adaptive stage between the corresponding inner products and vector differences of an immediately prior analysis stage;

form inner products of the current stage by projecting each vector difference of the immediately prior analysis stage onto the correlation direction vector of the current stage;

form scaled vectors of the current stage by multiplying the inner products of the current stage onto the correlation direction vector of the current stage;

form the projection of the prior stage vector differences onto the nullspace of the correlation direction vector of the current stage by subtracting each scaled vector of the current stage from the corresponding projection of the prior stage.

8. (Previously Presented) The computer program product of Claim 7 wherein the steering vector comprises the spreading code of a code division multiple access (CDMA) system.

9. (Currently amended) A method for adaptive filtering in a Multistage Wiener Filter (MWF) of a signal received over a channel subjected to multipath effects, the method comprising:

determining filter coefficients $\hat{\underline{c}}$, such that $\hat{\underline{c}} = E\left[\hat{\underline{\underline{R}}}\right]^{-1}\hat{\underline{s}}_{\text{desired}}$, where

E is the expected value operator,

$\hat{\underline{r}}$ is the received signal,

$\hat{\underline{s}}_{\text{desired}}$ is the modified steering vector of the desired signal, and

$\hat{\underline{s}}_{\text{desired}} = \underline{s}_{\text{desired}} * \underline{h}$, where

$\underline{h} = [h_1, h_2, \ldots h_L]$ is a discrete time estimate of the effect of multipath on the channel and L is the delay spread of the channel for the estimate.

10. (Previously Presented) The method of claim 9, wherein the steering vector of the desired signal is the spreading sequence of the desired signal in a code division multiple access communication system.

11. (Previously Presented) The method for adaptively analyzing an observed signal, the signal characterized by a set of data vectors, to estimate that part of the signal that best corresponds to a steering vector, the method comprising:

modifying the steering vector, wherein the modified steering vector is formed by the convolution of the steering vector with a vector estimating the effect of multipath on the observed signal;

in a first analysis stage:

projecting each data vector onto the steering vector to form a set of inner products that estimate the part of the data that best corresponds to the steering vector,

multiplying the inner products onto the steering vector to form a set of vector estimates of that part of the data that best corresponds to the steering vector,

subtracting the vector estimates from the corresponding data vectors to obtain a projection of the data onto the nullspace of the steering vector; and

in at least one adaptive analysis stage:

calculating a correlation direction vector of the current adaptive stage between the corresponding inner products and vector differences of an immediately prior analysis stage;

forming inner products of the current stage by projecting each vector difference of the immediately prior analysis stage onto the correlation direction vector of the current stage;

forming scaled vectors of the current stage by multiplying the inner products of the current stage onto the correlation direction vector of the current stage;

forming the projection of the prior stage vector differences onto the nullspace of the correlation direction vector of the current stage by subtracting each scaled vector of the current stage from the corresponding projection of the prior stage.

12. (Previously Presented) The method of Claim 11 wherein the steering vector comprises the spreading code of a code division multiple access (CDMA) system.